**Supplementary Material**

**Misinformation and party politics: A comparative analysis across 26 countries suggests misinformation is linked to radical-right populism**

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| --- | --- |
| Country | Tweets |
| Australia | 578,275 |
| Austria | 184,904 |
| Belgium | 253,127 |
| Canada | 1,466,357 |
| Denmark | 378,638 |
| Finland | 619,203 |
| France | 1,718,787 |
| Germany | 1,537,181 |
| Greece | 512,545 |
| Iceland | 29,577 |
| Ireland | 756,056 |
| Italy | 1,058,601 |
| Latvia | 124,206 |
| Luxembourg | 31,587 |
| Malta | 146,454 |
| Netherlands | 658,676 |
| New Zealand | 106,676 |
| Norway | 117,683 |
| Poland | 1,964,356 |
| Slovenia | 407,362 |
| Spain | 2,392,805 |
| Sweden | 714,705 |
| Switzerland | 304,272 |
| Turkey | 4,024,929 |
| United Kingdom | 4,333,988 |
| United States | 2,262,500 |

***Table S1****: Number of Twitter messages per country used in the analysis*

|  |  |
| --- | --- |
| **Country** | **Factuality score** |
| Australia | 0.63 |
| Austria | 0.68 |
| Belgium | 0.74 |
| Canada | 0.71 |
| Denmark | 0.53 |
| Finland | 0.74 |
| France | 0.74 |
| Germany | 0.71 |
| Greece | 0.56 |
| Iceland | 0.63 |
| Ireland | 0.68 |
| Italy | 0.69 |
| Latvia | 0.68 |
| Luxembourg | 0.71 |
| Malta | 0.66 |
| Netherlands | 0.66 |
| New Zealand | 0.69 |
| Norway | 0.65 |
| Poland | 0.72 |
| Slovenia | 0.59 |
| Spain | 0.69 |
| Sweden | 0.56 |
| Switzerland | 0.59 |
| Turkey | 0.53 |
| United Kingdom | 0.59 |
| United States | 0.66 |
|  |  |

***Table S2****. Average factuality score by country*

|  |  |
| --- | --- |
| **Party family** | **Factuality score** |
| Agrarian | 0.68 |
| Christian democratic | 0.65 |
| Conservative parties | 0.62 |
| Ecological parties | 0.7 |
| Ethnic and regional parties | 0.68 |
| Left/Socialist | 0.69 |
| Liberal parties | 0.7 |
| Nationalist and radical right parties | 0.61 |
| Social democratic | 0.65 |
| Special issue party | 0.67 |

***Table S3.*** *Average factuality score by party family*

A graph of a bar

Description automatically generated with medium confidence

***Figure S1****. Histogram of the variable factuality score*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Mean | Min | Max | Sd. deviation |
| Factuality score centered by country mean | 0.000 | -0.151 | 0.076 | 0.036 |
| Factuality score | 0.661 | 0.454 | 0.750 | 0.072 |
| Personalization | -0.872 | -2.883 | 3.331 | 1.260 |
| Populism | 0.400 | 0.025 | 0.970 | 0.283 |
| Internal cohesion | 0.193 | -3.422 | 2.857 | 1.322 |
| Left- right | 4.946 | 1.062 | 9.174 | 1.712 |
| Government participation | 0.209 | 0.000 | 1.000 | 0.408 |

***Table S4.*** *Descriptive statistics of the variables*

A graph of a person's score

Description automatically generated with medium confidence

***Figure S2****. Association between factuality score, parties’ left-right ideology (right), and populism (middle), and government participation (left)* with 95% confidence intervals

A graph of a chart

Description automatically generated with medium confidence

***Figure S3.*** *Box-plot of factuality scores by country means by party family*

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Model 1** | | | | **Model 2** | | | |
| **Term** | **Estimate** | **Std. Error** | **p-value** | **Log Odds** | **Estimate** | **Std. Error** | **p-value** | **Log Odds** |
| DV | Factuality score | | | | Factuality score | | | |
| (Intercept) | 0.790 | 0.113 | 0.000 | 1.120 |  |  |  |  |
| Populism | 0.262 | 0.167 | 0.116 | 1.182 |  |  |  |  |
| Left-right | -0.011 | 0.0168 | 0.531 | 1.017 |  |  |  |  |
| Cabinet party | 0.018 | 0.028 | 0.531 | 1.028 | 0.031 | 0.029 | 0.296 | 1.031 |
| Internal cohesion | -0.008 | 0.0102 | 0.410 | 1.010 | -0.015 | 0.011 | 0.191 | 0.985 |
| Personalization | -0.003 | 0.0148 | 0.862 | 1.015 | 0.001 | 0.016 | 0.955 | 1.001 |
| Populism: left-right | -0.087 | 0.0288 | 0.002 | 1.029 |  |  |  |  |
| Party family: Ecological party is the baseline | | | |  |  |  |  |  |
| Left |  |  |  |  | 0.020 | 0.061 | 0.745 | 1.020 |
| Social democratic |  |  |  |  | -0.056 | 0.053 | 0.293 | 0.946 |
| Liberal |  |  |  |  | -0.054 | 0.055 | 0.325 | 0.947 |
| Christian Democratic | |  |  |  | -0.072 | 0.067 | 0.279 | 0.930 |
| Conservative |  |  |  |  | -0.190 | 0.059 | 0.001 | 0.827 |
| Radical-right |  |  |  |  | -0.339 | 0.062 | 0.000 | 0.713 |
| Agrarian |  |  |  |  | 0.054 | 0.093 | 0.564 | 1.055 |
| Ethnic |  |  |  |  | 0.043 | 0.073 | 0.556 | 1.044 |
| Special Issue |  |  |  |  | -0.052 | 0.101 | 0.608 | 0.950 |
| sd (Intercept) | 0.263 |  |  | 1.300 | 0.261 |  |  | 1.298 |
| Parties | 134 |  |  |  | 125 |  |  |  |
| Countries | 26 |  |  |  | 25 |  |  |  |

***Table S5****. Regression output of generalized linear mixed-effects models with county random effects.*

A graph of different colored lines

Description automatically generated

***Figure S4.*** *Predicted values of the factuality score, categorized by party position on the left-right scale and populist ideology with 95% confidence intervals. Values were obtained from the same model as Figure 3, but without the hierarchical structure.*

A graph with blue lines and dots

Description automatically generated with medium confidence

***Figure S5.*** *Predicted probability of factual scores by party families with 95% confidence intervals.* *Values were obtained from the same model as Figure 4, but without the hierarchical structure.*

A graph with many rectangular boxes

Description automatically generated with medium confidence

***Figure S6.*** *Box-plot of populism by country means by party family*

**Validation of factuality measure**

To ensure the robustness of our methods for identifying misinformation, we conducted a comprehensive manual validation of the articles shared by politicians. We selected a stratified random sample of 50 articles from each of the five predefined factuality levels, totaling 250 articles.

The purpose of this validation is to make sure that the articles shared by the politicians in fact contain misinformation. Not all articles from low-factuality sources contain misinformation, and it may be that the politicians are sharing only those that contain factual information. By validation, we hence mean that (1) lower-factuality outlets should, on average, offer lower-quality articles compared to higher-factuality outlets, and (2) a substantial fraction of the articles from low-factuality sources should represent misinformation or clearly misleading information.

The validation process involved the following steps:

1. **Randomization and blind review**: Articles were presented to the coder in a randomized sequence, ensuring that the coder was unaware of the pre-assigned factuality labels to eliminate potential bias.
2. **Classification criteria for information quality**: Articles were assessed and classified into one of five categories. These are given a number between 0 and 1, to enable aggregating the result for each category. The categories where operationalized as follows:
   * **0.0 - Explicit misinformation**: Articles in this category explicitly spread false information or directly contribute to widely recognized conspiracy theories. The content is demonstrably incorrect and is intended to mislead the audience. These articles may include fabrications, intentionally distorted facts, or claims that have been thoroughly debunked by credible sources.
   * **0.25 – Strongly misleading**: Articles that contain substantial elements of misinformation, though they might not propagate outright falsehoods. These pieces often manipulate facts, take information out of context, or exaggerate details to support false or misleading narratives. While there may be fragments of truth, the overall presentation is designed to misinform readers by distorting reality.
   * **0.5 – Misleading**: Articles in this category are generally misleading but do not contain direct lies. Instead, they may selectively omit crucial facts, present information in a way that skews understanding, or use suggestive language to imply false conclusions. The misinformation in these articles is more subtle, making them harder to identify as deceptive at first glance.
   * **0.75 – Partially misleading**: These articles contain factual information but may include significant omissions or lack crucial context, leading to a potentially distorted view of the topic. While the majority of the content is fact-based, selective presentation or biased framing introduces confusion or misrepresentation of the overall picture. Readers may walk away with an incomplete or false understanding of the issue.
   * **1.0 – Factually accurate**: Articles in this category are based on verifiable facts and provide a generally accurate portrayal of events or topics. However, even within factual reporting, there may be subtle biases, partiality, or emphasis on specific aspects that reflect the author's viewpoint. Such biases are natural in media, and do not necessarily undermine the factual integrity of the piece. Readers can trust the information but should remain mindful of potential perspectives that influence its framing.

It should be noted that the quality measure applied on individual articles should not be confused with the factuality ratings assigned to news outlets in the database, as they represent fundamentally different concepts. As will be discussed below, articles that are isolation factual in isolation can nonetheless be part of pushing a broader misleading narrative. Since the databases used in this study assess factuality at the media outlet level, their definitions cannot be directly applied to individual articles. It should hence not be expected that the mean information-quality of articles should precisely match the factuality of the media outlets.

1. **Handling unverifiable articles**: Out of the initial 250 articles, 52 could not be accessed or lacked sufficient content to assess their veracity. These articles were excluded from the final analysis.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Factuality group** | **Misinformation** | **Strongly misleading** | **Misleading** | **Partially misleading** | **Factually accurate** |
| **Very high** | 0 | 0 | 0 | 0 | 38 |
| **High** | 0 | 0 | 0 | 4 | 38 |
| **Medium** | 0 | 0 | 3 | 8 | 26 |
| **Low** | 4 | 2 | 9 | 11 | 15 |
| **Very low** | 10 | 5 | 13 | 3 | 9 |

***Table S6:*** *The table reports how the articles of each factuality group were classified. The columns represent the information quality of the articles, and the rows represent the factuality groups of the associated media outlet. As can be seen, the high-factuality outlets tend to spread high-quality factual information, whereas the low-factuality outlets primarily spread misleading information or misinformation.*

|  |  |
| --- | --- |
| **Factuality group** | **Mean information quality** |
| **Very high** | 1.0 |
| **High** | 0.97 [0.95,1.0] |
| **Medium** | 0.90 [0.85, 0.96] |
| **Low** | 0.69 [0.59, 0.79] |
| **Very low** | 0.47 [0.36, 0.59] |

***Figure S7:*** *The table shows mean values and 95% confidence intervals, estimated using the standard error of the mean and the t-distribution. The table shows a strong association between the factuality group of the media outlet and the mean information quality of their articles.*

The results of the validation are shown in Table S6 and S7. The results show a strong relationship between the media outlet-level factuality and the mean information-quality of the articles, where the lower-factuality media outlets have on average lower-factuality of articles. While the high-factuality outlets spread only high-quality information, the very low factuality sources spread primarily misleading information or misinformation.

As the table shows, even the very low factuality sites often publish articles containing factual information that, in isolation, are not false or misleading. However, this does not mean that the articles cannot contribute to false or distorted representation of reality when viewed in their larger context. For example, the Russian state-controlled outlet RT (formerly Russia Today), known for serving as a major propaganda tool and banned in several countries for disseminating misinformation, often publishes articles that individually may not appear false or misleading. Yet, a broader view of its content reveals that these articles together produce a larger narrative that is skewed and misleading. In the case of Russia's invasion of Ukraine, for instance, RT’s coverage exclusively focuses on the successes of the Russian campaign, while omitting any mention of setbacks or losses. Although each individual article may be factually correct in its reporting on individual battles, the overall story is thus a false narrative of a highly successful ‘special military operation.’ This underscores the limitations of assessing factuality solely based on the accuracy of individual articles, offering further support for the validity of relying on media outlet-level analyses.

In conclusion, our validation shows that there is a strong connection between the factuality category of the outlet, and the articles associated to it shared by politicians. It furthermore shows that a substantial fraction of the articles from low-factuality outlets shared by politicians are indeed misinformation.